PROGRESS
OF
MEDICAL SCIENCE

SURGERY

UNDER THE CHARGE OF
T. TURNER THOMAS, M.D.,
ASSOCIATE PROFESSOR OF APPLIED ANATOMY AND ASSOCIATE IN SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE PHILADELPHIA GENERAL HOSPITAL AND ASSISTANT SURGEON TO THE UNIVERSITY HOSPITAL.

Bile Peritonitis without Evident Perforation of the Biliary Tract.—BUCHANAN (*Surg., Gynec. and Obst.*, 1918, xxvi, 303) says that effusion of bile into the peritoneal cavity has received serious attention only within the last seven years. He reports a typical case, and the results of a study of the literature, from which he concludes that there is no typical disease picture to account for a bile peritonitis without evident perforation of the bile tract. There is a group of recorded cases, with abundant effusion, in which no perforation could be demonstrated at operation or autopsy. These cases may be accounted for in a variety of ways, some fitting one hypothesis and some another, no one theory suiting all cases. The bilious nature of the effusion still lacks the proof of a chemical examination. It is to be hoped that subsequent cases may be subjected to the test for bile acids and bile salts. The cases being so unusual and so atypical the diagnosis has not yet been made even tentatively, the real condition having never been even suspected in any of the published cases. The treatment should be dry mopping of the peritoneal cavity and direct drainage of the common duct.

The Method of New Joint Formation in Arthroplasty.—PHEMISTER and MILLER (*Surg., Gynec. and Obst.*, 1918, xxvi, 406) made an extensive experimental study on dogs and performed three types of operation, the no-flap, pedunculated and free flap, the results being studied and compared. (1) In the no-flap operations: A joint cavity forms which is diminished in size because of more or less obliteration of the recesses about the margins from thickening and ossification of the capsule and adhesions of the synovia. Excised portions of the capsule and synovia are rapidly but atypically restored. Villous synovitis is frequently present even in the oldest experiments. Articular surfaces form on the ends of the bones as follows: over the prominent portions which contact with and are pressed upon by the opposing bone, a dense bare bony surface forms which as a result of motion soon becomes smooth and shiny; over the sides, grooves and depressed portions, which are subjected to little or no pressure, a fibrous covering forms by outgrowth from the open cancellous spaces along the surface. With increasing age the fibrous covering usually tends to spread over the entire bony surface, gradually absorbing and replacing the dense bare bony areas. This change is a slow one and in some of the oldest and best functionating joints large bony surfaces were present, the process seeming to be at a standstill. The range of motion varies from 50 degrees to almost normal, and generally was greater in the elbow than in the knee. (2) In the pedunculated-flap operations: The flap early undergoes pressure necrosis and disappears except about the margins and along the grooves where it is not pressed upon. As motion is reëstablished, more of the remaining portions are destroyed until eventually little of the flap is left. Only a small part of the base of the flap receives its nutrition through the pedicle. Any other portions which survive become attached to the ends of the bones and participate in the formation of a fibrous articular covering for the region. The changes in the articular surfaces of the ends of the bones are practically identical with those occurring in the no-flap operations. In the regions subjected to pressure a dense polished bony articular surface forms, while in those subjected to little or no pressure a fibrous covering forms partly by outgrowth from the underlying bony surface and partly from surviving remnants of the flap. The size and appearance of the reformed joint cavity and the range of motion were about the same as in the no-flap experiments. (3) In the free-flap operations: The flaps break down and disappear in the same manner and to about the same extent as in the pedunculated flap operations. The changes in the articular surfaces of the bones and the character and mobility of the reconstructed joint are the same as in the other two sets of experiments. Infection, prolonged immobilization, displacement and too extensive and imperfect resection unfavorably influenced all three groups of experiments to about the same degree. *Hence it matters little in experiments on the normal knee and elbow-joints of dogs whether arthroplasty is performed by the no-flap, pedunculated flap or free-flap method. The flaps when used very largely break down and the newly formed joint is about the same, both structurally and functionally, following the three types of operations.*

Arthroplasty with the Aid of Animal Membrane.—Baer (*Am. Jour. Orthop. Surg.*, 1918, xvi, 171) furnishes a further contribution on arthroplasty by the interposition of chromicized pigs' bladder. The object in using a chromicized membrane is to obtain a substance which will remain intact for a long enough period to allow the changes to occur which take place in the construction of the fibrous tissue over the ends of the bones. At the end of the time it should be absorbed, leaving no foreign body, living or dead, within the joint. In this way the joint can approach in character nearest the normal. Such a membrane is found in the chromicized pig's bladder, which has been found experimentally and at second operations on the human subject to remain intact from sixty to one hundred days, a period long enough to allow a new joint to be made. The greatest possible care in technic is necessary, although there is not the same amount of traumatism or interference with the circulation in the periarticular tissue as is caused by the various flap operations. At the same time the utmost care must be taken in the antiseptic treatment. The author believes that a membrane arthroplasty is the last form of arthroplasty, as no foreign substance remains within the joint. Therefore there is no pain from any remaining interposed living tissue. The operation itself is less extensive than a flap or muscle implantation, and the periarticular tissues are less interfered with. There is no interference with the integrity of a normal part by the removal for a flap of any adjacent structures. Less resection has to be made in order to interpose the intermediary substance. In properly selected cases good, serviceable, painless motion can be obtained by a membrane arthroplasty in most joints, particularly in the jaw and in the hip-joint. In the knee-joints, fibrous ankylosis of the entire joint or bony ankylosis of the femoropatellar articulation gives excellent results by this mode of arthroplasty. In true bony ankylosis of the femorotibial joints the results are still unsatisfactory, but give hope of better results with a better consideration of the difficulties involved.

Fractures of the Skull.—Sharpe (*Med. and Surg. Jour.*, 1918, ii, 319) says that it has become quite a common belief that once a man has had a fracture of the skull and then recovers he is never the same person again. In 1912 he examined the records of three of the large hospitals of New York City during the decade of 1900–1910. The mortality of fractures of the skull was 46 to 48 per cent.; the mortality of the patients operated on was 87 per cent.; this high percentage was due undoubtedly to the operation being postponed until the extreme stages of medullary compression and edema and also to the fact that the operation performed was the "turning down" of a bone flap—a much more formidable procedure than a decompression, and then the bone replaced so that even the benefits of a decompression were prevented. Besides in many cases the dura was not opened, and as the dura is inelastic in adults no adequate relief of the pressure could possibly be obtained. Of the patients, however, who were finally discharged as "well" or "cured" only 34 per cent. could be traced, and of these it was found that 67 per cent. were still suffering from the effects of the injury; that is, two-thirds of them were not as well as before the injury. The chief complaints were persistent headache; a change of personality of the depressed or excitable type, the patient being thus emotionally unstable; early fatigue making any prolonged mental or physical effort impossible, and thus causing inability to work; lapses of memory, spells of dizziness and faintness; and even epileptiform seizures in a small percentage of cases. With few exceptions these cases regained consciousness gradually a few days after the injury and remained in the hospital for periods of four weeks and longer. Their charts made frequent mention of severe headache, a low pulse-rate of 60 or below, signs characteristic of increased intracranial pressure. An ophthalmoscopic examination had rarely been made. Many of these patients still showed the results of the increased intracranial pressure in their fundi and at lumbar puncture. Late decompression gave marked improvement in these cases. The operative findings were always associated with a "wet," swollen, edematous brain. Sharpe thinks many of the so-called post-traumatic neuroses are superimposed upon this definite organic basis as the result of the brain injury.

The Selection of Abdominal Cases for Operation. — RICHARDS (*British Med. Jour.*, April 27, 1918, p. 471), upon a basis of 200 operations for war injuries, says that the decision as to whether a man wounded in the abdomen should be operated on or not is usually based on the time which has elapsed since the injury and the rate and character of the pulse. Of the patients who survive operation performed in the first twelve hours a high proportion will have had their lives saved by it, and this is true in a lesser degree of those operated on in the second twelve hours. After this time most of those who survive operations are those whose injuries were not originally fatal. Men with a pulse of 120 or over have less than half the chance of survival of men with a lower pulse. Recently wounded men with a rapid pulse should nevertheless be operated on, provided that their condition is as good as it is ever likely to be, that they have a reasonable chance of surviving the actual operation and that the time taken does not prevent the proper treatment of other wounded. Every wound of the abdominal wall, however slight, should be explored, whether signs of internal injury are present or not. If it is found to be penetrating the abdomen should be opened. The necessity for deciding between the claims of abdominal and other cases can be best avoided by good theater organization, the provision of two tables for each surgeon and by not allowing slow operators to do abdominal work. If these measures are insufficient the decision should be left in the hands of the surgeon in charge of the preoperation ward.

A Method of Citrated Blood Transfusion. — ROBERTSON (*British Med. Jour.*, April 27, 1918, p. 477) says that the use of citrated blood for transfusion seems to fill a definite need in that the technic is relatively simple, easily acquired and can be carried out entirely by one medical officer. Furthermore, this method obviates the necessity of having the donor and recipient together, and the blood can be given at the bedside. Stress is laid on the fact that although the technic is apparently simple, certain definite precautions must be observed in the handling of the blood in order to obtain good results. The chief considerations in the technic are to get the blood quickly and cleanly into the citrate, to obtain prompt and thorough mixing of the blood with the citrate and to transfuse the blood so soon as possible after the bleeding. An apparatus is described which can easily be constructed and has been found to work satisfactorily. The blood is received into isotonic sodium citrate, 3.8 per cent. The amount of this solution, 160 c.c., contains 6 grams of sodium citrate, which has no harmful effect. When a good flow is maintained through a needle of adequate caliber and the blood and citrate are well mixed as large a quantity as 800 c.c. of blood may be obtained by this method. A series of 44 citrate transfusions were given under rush conditions at a casualty clearing station, with good results. The immediate effect of the transfused blood and subsequent progress of the cases were fully as good as that seen following ordinary transfusion. No reactions of any consequence were observed.